(No Model.)

# I. E. CHANDLER.

## MECHANISM FOR FEEDING LACING HOOKS, &c.

No. 535,572. Patented Mar. 12, 1895.

Fig. 1.

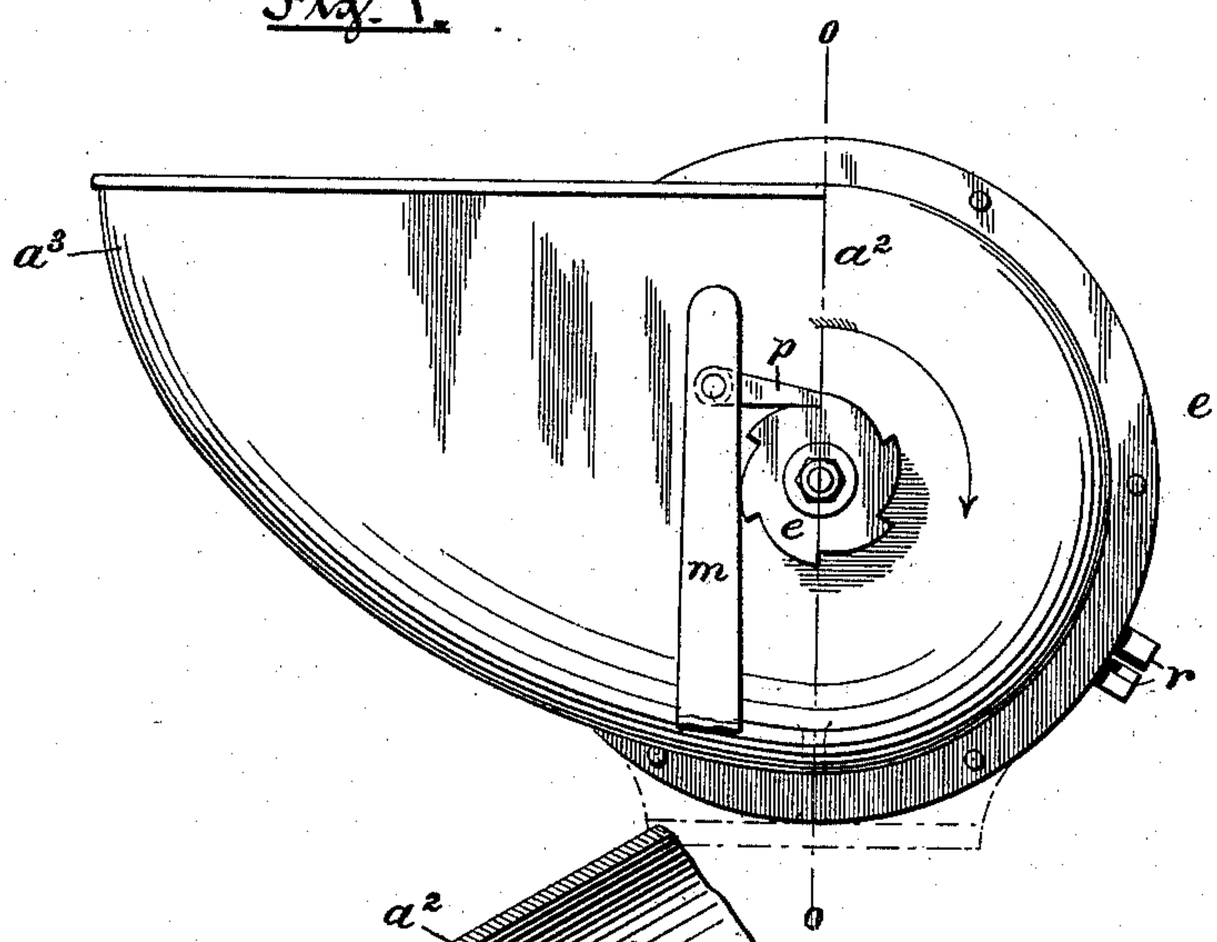
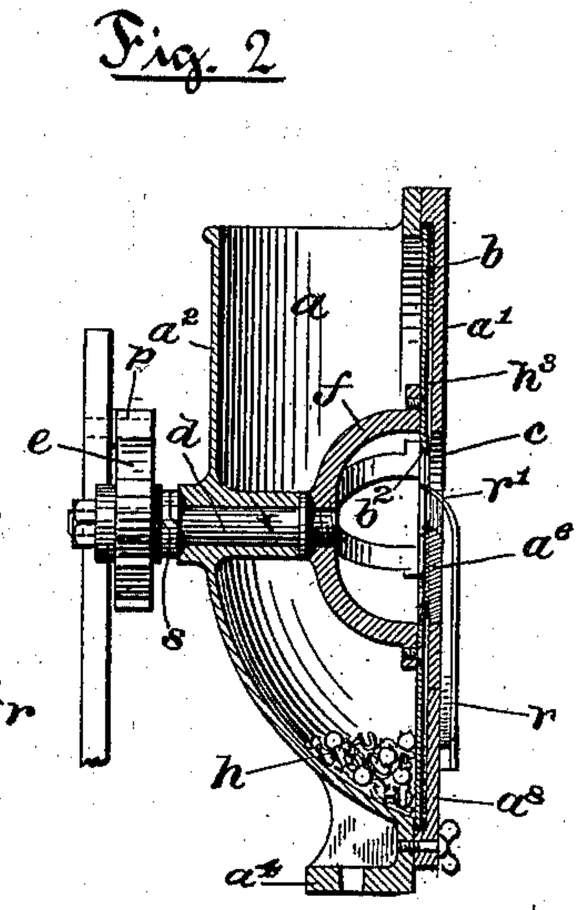



Fig 2



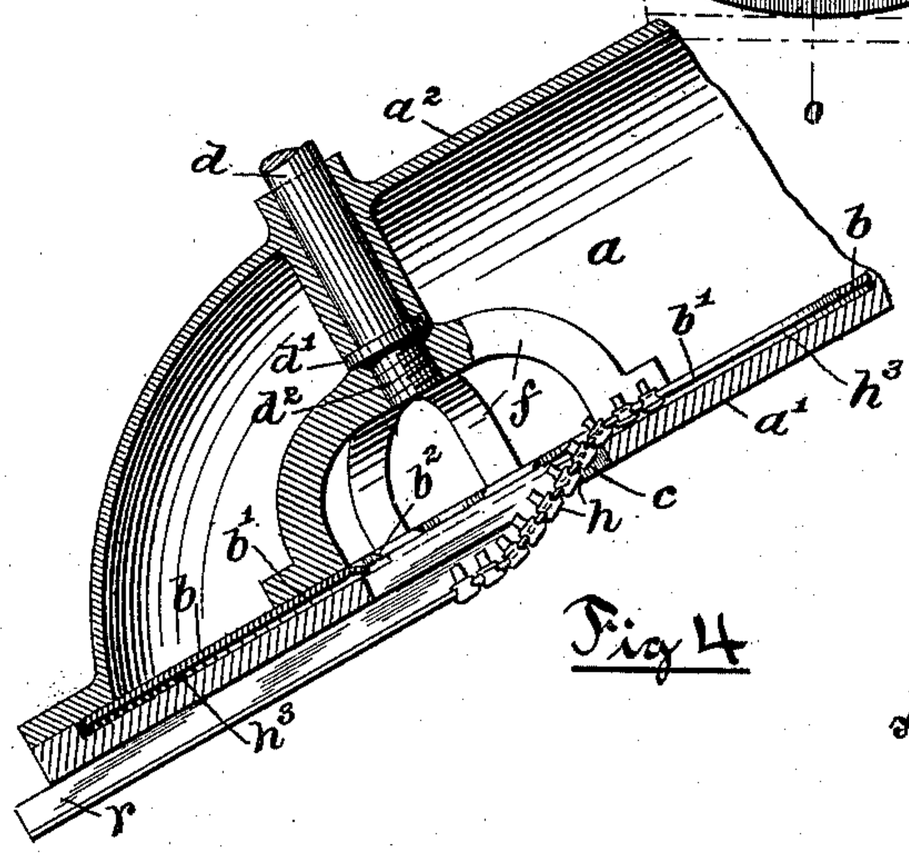




Fig 4

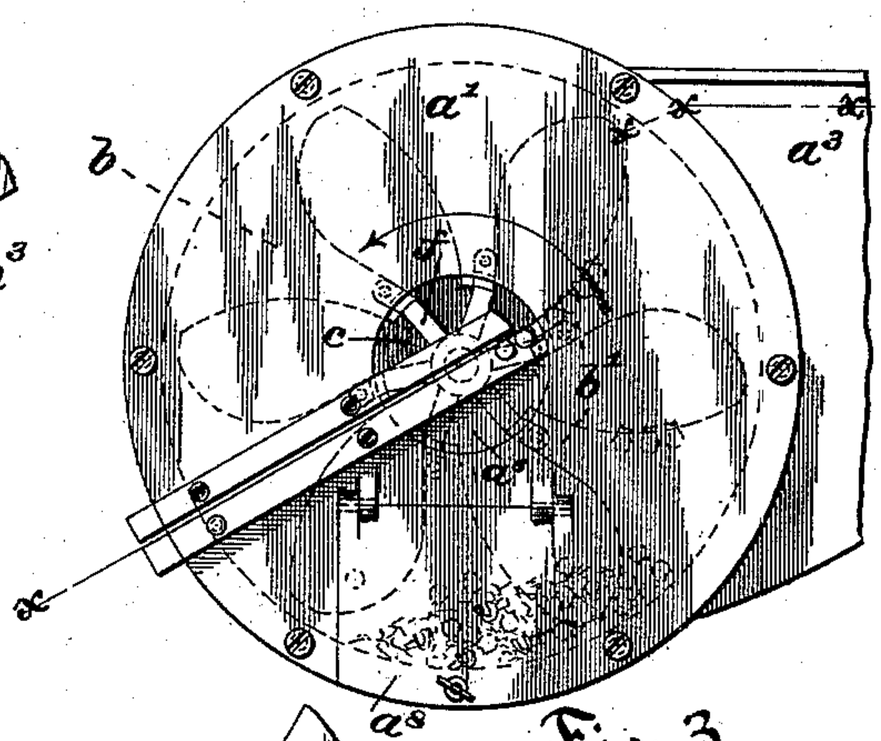



Fig 3

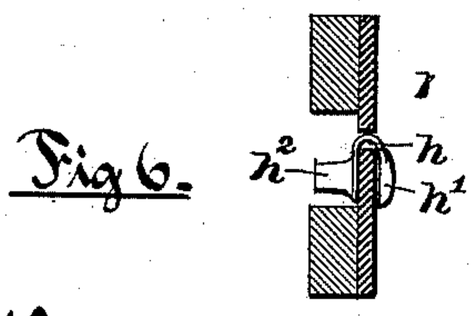



Fig 6.

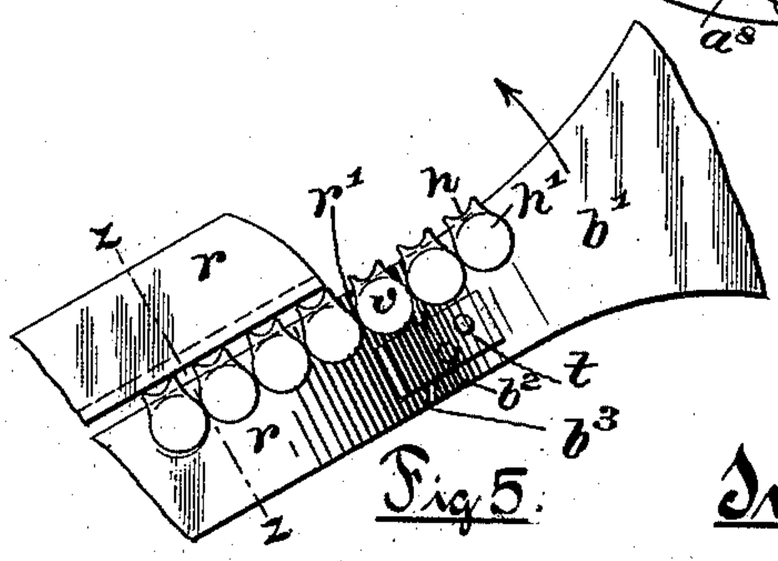



Fig 5.

Witnesses.

Fred. Arnold.

Harold Lenox.

Inventor.

Isaac E. Chandler.

by Remington & Hawthorne

Attorneys.

# UNITED STATES PATENT OFFICE.

ISAAC E. CHANDLER, OF PROVIDENCE, RHODE ISLAND.

## MECHANISM FOR FEEDING LACING-HOOKS, &c.

SPECIFICATION forming part of Letters Patent No. 535,572, dated March 12, 1895.

Application filed December 5, 1894. Serial No. 530,876. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC E. CHANDLER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Mechanism for Feeding Lacing-Hooks, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates generally to improvements in devices for mechanically feeding lacing-hooks, so called, singly from a hopper or reservoir containing the lacing-hooks in bulk to a suitable chute or runway communicating with the feeding device.

In feeding devices of the type or class just referred to it has been usual heretofore, so far as I am aware, to employ a stationary reservoir, combined with an intermittingly rotating feeding-plate, or pick-up plate, provided with arms arranged to pass through the mass of lacing-hooks contained in the reservoir, thereby in its passage picking up or collecting on the advance or forward edges of the arms more or less of the hooks, which latter during the rotation of the feeding-plate slide on to the rear or heel edge of the immediately preceding arm and from which heel edge some or all of the lacing-hooks thereon finally slide from its outer periphery by gravity through a suitable opening or aperture formed in the periphery of the reservoir and lying in the path of the arms, said aperture in turn communicating with a chute or runway leading downwardly to a suitable setting device. In such former constructions it will be seen that the mechanically picked up lacing-hooks do not remain upon the respective pick-up arms of the feeding-plate until they are discharged or admitted into the runway but during the rotation of the plate are automatically transferred to the adjacent edges of the contiguous forward arms, after which the lacing-hooks pass therefrom and enter the runway through an opening formed in the periphery of the reservoir, the runway being in substantially the same plane with that in which the feeding-plate rotates. The collected hooks slide off the extreme outer ends of the arms into an opening formed in the periphery of the reservoir casing, considerably below the casing's center, and onto an inclined runway whose upper end extends into said opening.

There are objections to the feeding devices just described. The pick-up plates or arms must necessarily be rotated in an intermittent manner in order that the delivery sides or edges thereof shall stop contiguous to the fixed opening formed in the periphery of the reservoir and communicating with the upper end of the runway, the arrangement being such that it forms what may be termed a peripheral discharge for the lacing-hooks. The speed of rotation is comparatively slow. The lacing-hooks are liable to stop or become lodged midway of the reservoir's opening when the runway is filled with hooks so that the succeeding movement of the feeding-plate not only destroys the hook but the adjacent parts of the machine itself are thereby subjected to undue pressure, and frequently disabling it.

The object I have in view in the present invention is to overcome some or all of the disadvantages inherent in former devices for feeding lacing-hooks.

To that end it consists essentially in the novel construction and arrangement of the feeding-plate with respect to the reservoir, runway, &c., whereby the properly picked up lacing-hooks are delivered to a central opening communicating with the upper end of a suitably constructed and arranged runway, thus forming a central discharge for the hooks, all as will be more fully hereinafter set forth and claimed.

By means of my improved feeding device the lacing-hooks picked up or collected by it remain on the same forward working side of the arm of the rotating plate from the time they are collected until they enter the runway, or in other words the same arm both picks up and delivers the hooks, the runway being located in a different plane from that in which the feeding-plate works. The front or delivery side of the reservoir is provided with an enlarged central opening into which the inner or free ends of the feeding-plate

arms converge and successively discharge their loads on to the upper end portion of the contiguously mounted inclined runway communicating therewith. Owing to this arrangement, and embodying the central discharge, the feeding-plate may be rotated much more rapidly and efficiently than feeding devices having a peripheral discharge. In fact it may be operated continuously, instead of intermittingly, if desired.

In my improved device the delivery ends of the revolving pick-up arms approach the fixed runway from the under side, that is, while they are moving upwardly, therefore any overhanging lacing-hooks resting on the runway at the time will be knocked off back into the reservoir. Consequently no damage to the machine can result.

Another advantage obtainable by my invention, wherein the point of discharge is at the center portion of the reservoir, is that the runway leading therefrom may be readily changed so that the lacing-hooks may be presented relatively to the setting device in different positions, as desired.

In the accompanying drawings illustrating my present improvement, Figure 1 is a rear side elevation of the hopper or reservoir, &c. Fig. 2 is a transverse sectional view, taken on line *o*, *o*, of Fig. 1. Fig. 3 is a front side elevation, showing the central discharge opening and a runway communicating therewith. Fig. 4 is a sectional view, enlarged, taken on line *x*, *x*, *x*, of Fig. 3. Fig. 5 is a front elevation, enlarged, of the adjacent portions of the runway and one of the feeding-plate arms at substantially the instant the lacing-hooks slide from the latter on to the runway, and Fig. 6 is a transverse sectional view of the runway, taken on line *z z* of Fig. 5.

I would state here that while my feeding device is more particularly adapted to be employed in machines for setting lacing-hooks it may be used for picking up and feeding other articles without materially changing its construction, such for example as button-fasteners, staples, &c. I would further add that inasmuch as the invention resides solely in the feeding device I have deemed it unnecessary to represent herewith an organized machine provided with setting mechanism, &c.

Again referring to the drawings, *a* indicates a hopper or reservoir adapted to contain lacing-hooks *h* in bulk. It may be open on top and provided with an extension $a^3$, thereby increasing its holding capacity. The rear or back side wall $a^2$ of the reservoir is curved along its lower portion in order to keep the mass of lacing-hooks well toward the front, and is provided with a central hub arranged to form a bearing for the rotary spindle *d*, soon to be described. The front side wall *a'* of the reservoir is substantially a flat plate secured to a circular flange of the reservoir. This front wall or plate is provided with an enlarged central opening *c* through which the hooks are fed to the runway, and with a door $a^8$ covering an aperture at or near the bottom through which latter opening the hooks may be quickly removed from the reservoir when desired.

The feeding-plate wheel or disk *b* is made of comparatively thin stock, as steel. Its center as well as some of the body portion is cut away to form a series of pick-up arms or blades *b'*, connected at the outer rim or periphery, and converging toward the center. See Fig. 3. The inner or free ends of said arms are independent of each other and terminate at or near the front central opening *c* before described. The forward or working edges of the blades (with respect to the direction of rotation) are, as drawn, curved somewhat in order to better hold the hooks thereon until the instant of discharge or delivery.

The feeding-plate *b* is revoluble. In the drawings the means for effecting such movement consist of a spindle *d*, mounted in the reservoir bearing before described, having its inner end provided with a fixed collar *d'* (Fig. 4) and screw-threaded extension $d^2$. To this latter is firmly screwed a skeleton or spider having bent radiating arms *f*, the outer ends of which are secured to the arms of the plate *b*, thereby forming open spaces through and between which the surplus hooks may fall from the feeding-plate into the bottom of the reservoir chamber. To the outer end of the spindle is secured a ratchet-wheel *e*, intermittent motion being imparted to the latter by an engaging pawl *p* pivoted to a suitably mounted vibrating arm or lever *m*. For the purpose of checking or arresting the momentum of the spindle and its attached parts I may provide a suitable tension spring *s*, located between the adjacent faces of the hubs of the ratchet and reservoir, as shown in Fig. 2. The feeding-plate may be rotated continuously, in which case a belt-driven pulley may be substituted for the ratchet-wheel, pawl, &c.

The lacing-hooks *h* represented are provided each with an eyelet-shank $h^2$, head or front *h'* and bent offset hook portion uniting the shank and front, substantially as common. They are adapted to be picked up on the forward edge of the thin blades *b'* in such manner that the shanks $h^2$ project therefrom inwardly or toward the rear of the reservoir while the heads or fronts *h'* overhang the opposite side of the blades and extend into a narrow space $h^3$ formed between the adjacent faces of the wall *a'* and the plate *b*. See Figs. 2 and 4. It may be added that the length of the shanks $h^2$ of the hooks usually considerably exceed the thickness of the heads *h'*. Obviously the thickness of the said space $h^3$ is somewhat greater than the thickness of the hook-heads in order that the latter may travel therein without being disarranged by contact with the front wall *a'*.

The runway *r* may be constructed substantially as usual, that is, it may consist of two thin strips of metal separated from each other

edgewise by a clear space along and between which the hook portion of the lacing-hooks freely slide. The strips or runway proper are suitably secured in an inclined position and are offset sufficiently from the wall $a'$ to permit the shanks $h^2$ of the hooks to pass without contact therewith. In the present device I prefer to bend the ends of the arms $b'$ outwardly, toward the front, as at $b^2$, and to bend the upper end of the hook-receiving portion of the runway strip inwardly or rearwardly, as at $r'$, so that when the said two bent portions coincide, as shown in Figs. 4 and 5, the hooks slide freely from the arms through the central discharge opening $o$ on to the fixed runway and thence downwardly to any suitable setting device. It will be seen, referring more particularly to Fig. 5, that the adjacent ends or edges of the said parts $b^2$ and $r'$ are curved, see $b^3$, the center from which the curve is described being the center of the axis of rotation of the plate $b$. It will also be seen, referring to said Fig. 5, that the lower member or hook-supporting portion of the runway extends at its upper bent end $r'$ a short distance above or beyond the fellow member of the runway and that the arms $b'$ are provided each with a fixed knock-off lug or clearer $t$, the free end of the latter extending over the runway. By means of this arrangement it will be apparent that when the runway is completely filled with hooks any surplus hooks, as the one marked $v$, whether properly or improperly mounted thereon, will be forcibly detached from the runway by contact with the advancing clearer and it, as well as any hooks collected at the time on that arm, will then drop back into the reservoir. I prefer to close the lower portion of the center opening $c$ by means of a piece $a^6$, fitted therein below the runway. See Figs. 2 and 3.

In my improved hook-feeding device hereinbefore described it will be seen that hooks or articles contained in the reservoir $a$ are picked up or collected on the advancing edge of the arms of the rotating plate $b$ and that they remain thereon until they pass on to the runway, or fall back into the reservoir, and since the discharge opening $c$ is at the center, instead of a peripheral discharge opening, the plate may be rotated more rapidly, because the speed of the arms $b'$ at the point of delivery is relatively very much slower than at the periphery of the plate. In fact it is practically operative when rotating continuously. The form or shape of the runway itself may be changed so as to deliver the lacing-hooks from its lower end in any desired manner with respect to the setting mechanism; its upper end in any event being arranged and adapted to communicate with the free ends of the feeding-plate arms.

While I prefer to employ a stationary reservoir, arranged substantially as represented, yet it is practicable to rotate it in unison with the plate $b$ and thus feed the hooks through the central opening $c$ to the runway, the latter remaining stationary. In such case the reservoir would obviously be closed so that the contents could not escape except through the said discharge opening.

I claim as new and desire to secure by United States Letters Patent—

1. In a device for feeding lacing-hooks, the combination of a reservoir containing the lacing-hooks in a loose state, a suitably mounted feeding-plate having converging pick-up arms or blades communicating with the reservoir, means for rotating said feeding-plate, a fixed plate practically forming the front wall of the reservoir having a central transverse opening therethrough, and a suitable runway having its upper or receiving end extending into the opening of the fixed plate and communicating with the said blades or arms of the feeding-plate, whereby lacing-hooks picked up by the arms of the revolving feeding-plate are automatically conducted transversely through the central portion of the feeding device into the runway.

2. In a device for feeding lacing-hooks, the combination of a stationary reservoir for containing lacing-hooks, an intermittingly-rotating feeding-plate having converging arms or blades bent outwardly or transversely at their inner or free ends and arranged to pick up lacing-hooks while passing through the reservoir, a fixed plate forming a wall of the reservoir provided with a transverse opening arranged in the circular path of the said bent ends of the feeding-plate arms and adapted for the free passage therethrough of the lacing-hooks, and a suitable runway having its upper or receiving end communicating with said fixed plate opening so as to receive the lacing-hooks as they slide off the arms.

3. In a device for feeding lacing-hooks, the combination with a reservoir for containing the hooks provided with a centrally apertured front wall, and a runway, of a revoluble feeding-plate located in the reservoir and adjacent to said front wall and provided with a series of converging arms or blades having their free ends communicating with the runway, whereby the rotation of the feeding-plate through the mass of lacing-hooks picks up on its arms more or less of said hooks which slide therefrom on to the runway, for the purpose set forth.

4. In a device for feeding lacing-hooks, the combination with a stationary reservoir, a fixed runway and a fixed plate forming the front wall of the reservoir having a transverse opening therethrough communicating with the upper or receiving end of said runway, of an intermittingly-rotating feeding-plate located contiguous to the inner face of said front wall provided with arms for picking up the lacing-hooks and having the free ends of said arms converging toward the center of the reservoir and communicating with said opening formed in the front wall and with the upper end of the runway, for the purpose set forth.

5. In a machine for feeding and setting lacing-hooks, a stationary reservoir containing the lacing-hooks in a loose state provided with front and rear walls or sides and having a transverse opening formed in said front wall at or near its center through which opening the hooks are discharged, a runway communicating with and leading from said opening adapted to conduct the lacing-hooks to suitable setting mechanism, a substantially flat or disk-shaped feeding-plate mounted in said reservoir having its central portion cut away and provided with a series of converging arms or pick-up members arranged to collect lacing-hooks thereon while passing through the reservoir and means for suitably rotating the feeding-plate, whereby the free ends of said arms or pick-up members are successively brought into position with respect to the said discharge opening and runway to allow the lacing-hooks properly mounted on the arms to slide therefrom into the runway by gravity.

6. The hook-feeding plate member, substantially as hereinbefore described, the same being practically flattened or disk-shaped and having portions thereof cut away to form suitably shaped arms or pick-up blades, the free ends of which blades terminate near the center or axis and from which ends lacing-hooks adapted to be collected on the arms are discharged by gravity.

7. The combination with a reservoir for lacing-hooks provided with a central discharge opening through one face or wall thereof and a runway leading therefrom, of a suitably mounted rotatable flat or substantially disk-shaped feeding-plate located in the reservoir having converging arms or members arranged in the plane of rotation of the feeding-plate and adapted to collect lacing-hooks thereon and to discharge them from the inner ends of the arms outwardly through said discharge opening of the reservoir to the said runway communicating with or lying in the path of the arms, by gravity, and having the inner or discharge ends of said arms and the adjacent end of the runway arranged to cooperate when in juxtaposition, substantially as described.

8. In a device for feeding lacing-hooks, the combination of a suitably mounted reservoir containing such hooks provided with a central transverse opening through which the hooks are discharged, a revoluble feeding-plate located in the reservoir having centrally converging arms for picking up and conveying said hooks, a suitable runway having its upper portion in communication with the said conveying arms successively, whereby the hooks slide from the arms through said central opening of the reservoir on to the runway by gravity, and means for knocking off the surplus hooks from the runway.

9. In a device for feeding lacing-hooks, the combination with a suitably mounted reservoir containing the lacing-hooks having front and rear walls united by side walls and a central discharge opening formed in its said front wall, as distinguished from a reservoir having a discharge opening formed in its periphery, and a suitable runway having its upper end extending into or communicating with said central discharge opening, of a feeding-plate arranged in the reservoir having converging arms or members adapted in use to pick up lacing-hooks thereon and deliver them to the said runway, a revoluble shaft or spindle mounted in the said rear wall of the reservoir provided at its inner end with fixed radiating arms secured to the feeding-plate, thereby imparting a corresponding movement to the latter, means for checking the momentum of the feeding-plate and means for removing surplus hooks from the runway, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

ISAAC E. CHANDLER.

Witnesses:

GEO. H. REMINGTON,

FREDERIC ARNOLD.